REMARKS

The present amendment is in response to the Office Action dated December 13, 2005, where the Examiner rejected claims 1-19. Claims 15-19 were rejected under 35 USC 112, second paragraph, as being indefinite. Claims 1-19 were rejected to 35 USC 102 grounds and 35 USC 103 grounds.

Claims 1, 3-5, 9, 11, and 15 have been amended. Support for the amended claims is found on page 12, lines 16-21 of the specification.

By the present Office Action response, the rejections of the Claims in the Detailed Action are addressed.

A. Claim Rejections - 35 USC § 112, second paragraph

The Examiner rejected claims 15-19 under 35 USC 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 has been amended to recite "an oxidizing gas mixture" in line 6 and "said oxidizing gas mixture" in line 12, instead of reciting "first gas mixture." Support for an oxidizing gas mixture is found in lines 16-21, page 12 of the specification. The Applicant believes that amended claim 15 overcomes the 35 USC 112, second paragraph rejection and is now in allowable form. Claims 16-19 also overcome the 35 USC 112, second paragraph rejection due to their dependency on claim 15, and are now in allowable form.

B. Claim Rejections – 35 USC § 103

The Examiner has rejected all claims under 35 USC 103 as being anticipated by Chooi et al. (Chooi), U.S. Patent 6,465,888 hereinafter referred to as "Chooi '888" in view of Lui et al. U.S. Patent 6,647,944, hereinafter referred to as "Lui '944". In light of the currently amended claims, the Applicant respectfully disagrees with this conclusion.

The Examiner on page 3 of the Office Action cites that Chooi teaches a method of removing a photoresist layer (see col. 7, lines 59-60) from an integrated circuit structure having an etched dielectric layer and exposing a barrier layer (215, see figure 2B); by feeding a gas mixture into a reactor comprising carbon monoxide (see col. 8, lines 1-10) and then selectively removing the photoresist layer with little or no etching of the exposed barrier layer (see figure 2b, col. 8. lines 11-16).

Unfortunately, the Examiner also states on page 5 of the Office Action that "Chooi et al. teaches **etching** the photoressit film by using carbon monoxide gas (CO)" (see col. 8, lines 17-33). However, the reference (Chooi) **does not teach removing** the photoresist film from the surface of the structure by using carbon monoxide gas.

The Applicant believes the Examiner mistakenly referred to an earlier Office Action in which the claims were rejected under 102(e) as anticipated by Chooi, on page 3 of the December 13, 2005 Office Action instead of citing a 103 rejection anticipated by Chooi '888 in view of Lui '944.

The Applicant argues that neither a 35 USC 102(e) or a 35 USC 103 rejection of the claims is appropriate.

With regard to Chooi, the applicant respectfully disagrees with the Examiner's interpretation of Chooi's invention.

Carbon monoxide is **only** mentioned in Chooi '888 in relation to the etching of the optional organic layer, dielectric layers and the optional stop-etch layer, which is accomplished using plasma-assisted dry etching chemistry (col.7, line 67 - col. 8, lines 1-7; col. 8, lines 16-23 and col. 9, lines 13-20).

Carbon monoxide **is not used** by Chooi to remove either the first or second photoresist layer. Chooi cites removing the first photoresist layer preferably by oxygen plasma ashing (col. 8, lines 10-12) and it is assumed that the second photoresist layer is also removed in a similar manner since no specifics on removing the second photoresist layer are given by Chooi (col. 8. lines 25-29).

Chooi '888 **does not** describe the use of an oxidizing gas mixture comprising carbon monoxide to remove a photoresist layer from an IC, thus the 102(e) rejection does not apply to the amended claims. Amended independent claims 1, 9 and 15 specifically point out that the gas mixture for **removing (not etching)** a photoresist layer comprises carbon monoxide and overcomes the 102(e) rejection. The dependent claims 2-8, 10-14 and 16-19 also overcome the 102(e) rejection due to their dependency on independent claims 1, 9 or 15, respectively.

As for the rejection of claims 1-19 under 35 USC 103, the Examiner states on page 5 of the Office Action that "Chooi et al. '888 teaches **etching** the photoresist film by using carbon monoxide gas (CO)" (see col. 8, lines 17-33). However, the Examiner states that the reference (Chooi) **does not teach removing** the photoresist film from the surface of the structure by using carbon monoxide gas.

The Examiner further states that Lui et al. '944 teaches removing a photoresist film by using carbon monoxide gas from the surface of the structure (see figures 1b-1c, col. 3, lines 65-67, col. 4, lines 1-14). Therefore, it would have been obvious to a person

of ordinary skill in the requisite art at the time of the invention was made to remove the photoresist film from the surface of the structure by using carbon monoxide gas (CO) in the process of Chooi et al. as taught by Lui et al. because removing the photoresist film by using carbon monoxide gas would prevent attack or cause damage to the bottom layer or the side wall of the structure.

Amended independent claims 1, 9 and 15 reflect the addition of a substantive limitation that comprises selectively removing the photoresist layer with an **oxidizing** gas mixture, which comprises carbon monoxide (CO), with little or no etching of the exposed barrier layer. Support for the "first gas mixture" being an "oxidizing gas mixture" is found on page 12, lines 11-16 of the specification.

Applicant has reviewed the description of Chooi '888, which teaches removing the photoresist layer by "oxygen plasma ashing". See col. 8, lines 11–12 and Examiner's comment on Page 3 of the Examiner's Office Action.

More particularly, Chooi '888 fails to teach the use of CO to remove the photoresist when the dielectric has been previously etched, which results in the selective removal of the photoresist layer with little or no removal of the barrier layer.

The Applicant has also reviewed the description of Lui '944, which teaches remvoing a photoresist layer with a **reducing or non-oxidizing** gas mixture which comprises carbon monoxide, NH_3 and no oxygen (col. 3, lines 55-61). The gas mixture utilized by Lui '944 is a reducing gas mixture which is completely different from the oxidizing gas mixture described by the Applicant. In fact, Lui '944 teaches away from the use of using oxygen containing plasmas for stripping/removing photoresist (col. 3, lines 61-64). While the gaseous mixture utilized by Lui '944 comprises carbon monoxide, it is not an oxidizing gas mixture. One skilled in the art of photoresist removal would not look

to Lui '944 for removing a photoresist with an oxidizing gas mixture, since Lui '944 is very specific in describing a gas mixture with no oxygen and comprising NH_3.

In view of the currently amended claims, the Applicant respectfully disagrees with this rejection and provides arguments to overcome this rejection below.

The amended independent claims 1, 9, and 15 overcome the Examiner's rejection because the amended claims teach the removal of a photoresist layer with an oxidizing gas mixture comprising carbon monoxide. Further still, the Applicant claims the selective removal of the photoresist layer with little or no removal of the barrier layer.

As stated in Section 2143 of the MPEP:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references (or references when combined) must teach or suggest all the claim limitations.
>
> The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure. Section 2143, MPEP Rev. 2.0, May 2004, pg. 2100-129.

Chooi '888 and Lui '944 fail to satisfy the 35 USC 103 obviousness standard because both patents fail to teach each element of the amended independent claims, namely the use of an oxidizing gas mixture comprising carbon monoxide (CO) to remove the photoresist when the dielectric has been previously etched to expose the barrier layer, which results in the selective removal of the photoresist layer with little or no removal of the barrier layer.

Additionally, in Chooi '888 and Lui '944 there is no motivation to combine these references to provide using an oxidizing gas mixture comprising carbon monoxide (CO) to remove the photoresist when the dielectric has been previously etched to the barrier

layer, which results in the selective removal of the photoresist layer with little or no removal of the barrier layer.

Finally, in Chooi '888 and Lui '944 there is no suggestion of success in using carbon monoxide (CO) in an oxidizing gas mixture to remove the photoresist when the dielectric has been previously etched to the barrier layer.

In addition, Graham v. John Deere, 383 U.S. 1, 148 USPQ 459 (1966) held that secondary considerations may be utilized to support an indicia of non-obviousness including unexpected results. Here, the unexpected result is the selective removal of the photoresist layer with a oxidizing gas mixture comprising carbon monoxide (CO) with little or no etching of the exposed barrier layer. Neither Choo '888 nor Lui '944 teach or suggest these results.

Thus, the Applicant submits that independent claims 1, 9 and 15 are in a state of allowance.

Regarding the remaining dependent claims, the Applicant contends these dependent claims should also be found to be in a state of allowance because they depend on independent claims 1, 9 and 15.

The Applicant has amended dependent claims 5 and 11 to omit NH_3 from the Markush list of gases in these claim(s) to more distinctly point out the differences between the gas mixture utilized in the instant invention to remove a photoresist layer and the reducing gas mixture described and taught by Lui '944.

Dependent claims 3, 4, 5 and 11 have also been amended to conform to the independent claims citing "an oxidizing gas mixture" instead of a first gas mixture.

The Applicant respectfully reserves the right to argue the merits of these dependent claims at a later time.

D. Conclusion

For all the foregoing reasons, allowance of claims 1-19 pending in the present application is respectfully requested.

Respectfully Submitted;

Dated: February 13, 2006

Michael A. Kerr
Patent Attorney
Reg. No. 42,722

Michael A. Kerr
VIRTUAL LEGAL, P.C.
3476 Executive Pointe Way, Unit 16
Carson City, NV 89706
Tel: (775) 841-3388
Fax: (775) 841-3389